Type.—In U. S. National Museum (Cat. No. 26883).

Type, male, allotype, and a large series of paratypes of both sexes, Jekyl Is., Georgia, June 23, 1923 (W. L. McAtee). Named in honor of the collector.

A NEW GENUS AND SPECIES OF THE NOTOPTEROUS FAMILY GRYLLOBLATTIDAE FROM JAPAN.

By A. N. Caudell and J. L. King, *U. S. Bureau of Entomology*.

INTRODUCTION.

During the summer of 1922, while in Seoul, Korea, the junior author had the pleasure of meeting the Honorable Edme Gallois, French Consul General for Korea. Monsieur Gallois has long been an enthusiastic entomological collector in Japan. During the course of a conversation M. Gallois spoke of an interesting insect he had taken in Japan and which he was unable to place as to family, however, he considered it an Orthopteron. From M. Gallois' verbal description the writer immediately placed the insect in question as possibly a species of Walker's genus *Grylloblatta* or a type closely allied to it. Subsequently on seeing the specimens, one male and one female, this conjecture was confirmed. Through the information thus gained it was possible later to secure specimens and with the kind consent of M. Gallois the following new genus and species are here described.

DESCRIPTIONS.

GALLOISIA, new genus.

Differing conspicuously from the nearctic genus *Grylloblatta* Walker in the rather remarkable tarsi, which in this new genus have the segments broad and furnished with a pair of articulated apical flanges on each segment except the fifth where there is a similar one but apparently not doubled; these projections are probably homologous with the tarsal pads, usually known as pulvilli, of many insects. Their appearance is shown by the accompanying illustrations, pl. I, figures 2 and 3, and they are described somewhat more in detail in the description of the species.[1] In *Grylloblatta* the tarsal segments are simple and without pulvilli, as shown by figures 4 and 5. Other characters of probable generic value, but less striking than the tarsal structure, are found in the cerci, which are nine segmented and much longer in proportion than the eight segmented ones of *Gryloblatta*, and the antennal segments, the third of which is about three times as long as the preceding one while in the nearctic genus that segment is scarcely longer than the second. Male only studied.

Type of genus.—Galloisia nipponensis, new species.

[1]Similar articulated appendages are found in certain other insects, as *Camptonotus carolinensis* Gerst. of the Orthopterous family Gryllacrinae.

Galloisia nipponensis, new species.

Description of adult male (from a dried specimen).—Head somewhat blattoid in form, moderately flattened and attached obliquely to the thorax; epicranial sutures distinct. Eyes very small, not very clearly defined, scarcely as large as the basal segment of the antenna, irregularly elongate in form and consisting of about 50 or 60 distinct fascetts, the whole very abortive in appearance. Ocelli absent. Maxillary palpi with five segments; basal segment subquadrate, 2d slightly elongate, 3d about as long as 1 and 2 together and moderately clavate, 4 and 5 subequal in length, each slightly shorter than 3 but similar in shape, the 5th more narrowly rounded apically, but less swollen. Labial palpi with three segments, the segments subequal in length, each about three times as long as broad and shaped about as in the last three segments of the maxillary palpi, but not quite so large. Clypeus subquadrate, but little broader than long, the cephalic half mesially membranous. Labium semicircular, the cephalic margin rounded. Antennae broken off, one at the 10th and one at the 14th segment, but each probably consisting of 40 segments, the number found in nymphs; the basal segment is moderately flattened, strongly so basally, and nearly twice as long as thick when viewed from the narrowest aspect, the broadest view making it subquadrate, the whole much larger than any of the other segments; second segment cylindrical and subquadrate; 3d segment cylindrical and elongate, being about three times as long as broad and about three times as long as the second; fourth and several following segments subquadrate or but little longer than broad, those towards the apex, judging from the antennae of nymphs, growing more slender and elongate.

Thorax very moderately convex dorsally; sternal plates small and well separated; pronotum slightly longer than broad, gently narrowed from in front backwards, the lateral margins very slightly rounded, the disk gently convex, the anterior margin very broadly rounded, the hind margin more narrowly rounded; near the anterior margin of the pronotum is a sinuate transverse sulcus; mesonotum about as long as the posterior width, anteriorly much narrower than posteriorly, the posterior width about equaling that of the posterior width of the pronotum; lateral margins nearly straight, the posterior margin gently concave; metanotum similar to the mesonotum in shape but slightly shorter.

Abdomen rather heavy, elongate, broadest mesially and with ten dorsal sclerites each with a few stout spinules situated near the sides; the tergites do not overlap the sternites, being separated by a pleural membrane; terminal dorsal segment descending laterally to embrace the cerci at their bases, apically acute triangular, the apex prolonged into a decurved subcylindrical, bluntly pointed projection twice as long as its basal width. In the nearctic *campodeiformis* this segment is apically rounded triangular, without any decurved prolongation. Pl. 3, fig. 1, shows this character of the species now being described. Coxities present as flattened plates the tip of each bearing a style; the left coxite is subtriangular and basally extending across barely more than half the width of the abdomen; the right coxite is elongate-triangular basally, decidedly more elongate than the left one, and apically narrowed into a cylindrical neck to which is attached the style; basally the right coxite is a little more than half as broad as the corresponding portion of the left coxite, and is without a chitinous process as described in Walker's *Grylloblatta campodeiformis*. Styles

simple, cylindrical, about five times as long as broad and apically bluntly pointed and bearing several slender spines noticeably longer than the width of the style. Cerci each with nine segments, the basal two being very closely united; the entire cercus is slightly more than twice as long as the posterior tibia; the basal segment is but slightly longer than broad, basally much swollen; 2d segment about twice as long as broad, and, like the rest, cylindrical; the other segments gradually growing longer and more slender, the terminal being about ten to twelve times as long as broad; there is an irregular ring of about three to six stout setiform spinules on each segment beyond the basal except the last where there is a single ventro-apical one, though broken off of the specimen here described, the socket only remaining; these spinules are somewhat longer than the cercal width at point of attachment, some of them about twice as long; the basal segment bears a single sub-dorsal spine, shorter than the others.

Legs stout, with rather heavy brownish yellow armature, the femora and middle and hind tibia armed dorsally with spines scarcely less stout than the ventral ones, the anterior tibia however furnished dorsally with hairs only, or with fine setae. Coxae large and armed beneath and laterally with numbers of fine spinules; anterior coxa longer than the others, being about two and one-half times as long as broad and about one-fourth shorter than the pronotum, the ventral margin is straight, the dorsal one convexly rounded, the widest point at the basal third; intermediate coxae a third shorter than the anterior ones and truncate-conical in shape; posterior coxae very like middle ones but a little longer. Trochanters oblong rounded cup-like plates, the anterior ones apically subtruncate, the others apically rounded, each about twice longer than broad and the middle and hind ones with two or three very short fine spinules near the apex. Anterior femora about three times as long as wide, mesially decidedly broadened; armed beneath on the inner margin with about a dozen short and rather stout spines and above with about as many moderately slender setae arranged in two longitudinal rows. Intermediate femora a little shorter than the anterior ones and scarcely as broad; armed beneath with seven or eight stout spines on each margin and above with nearly a score similar spines roughly arranged in four longitudinal rows of three or four each except the intero-dorsal row where there are seven; most of these dorsal and lateral spines are fully as stout as the ventral ones. Posterior femora very like the intermediate ones and similarly armed.

Anterior tibia somewhat shorter than the corresponding femur, unarmed above but armed beneath with four or five rather stout spines on each margin and with two ventro-apical spurs, the inner one the longer, being as long as the basal tarsal segment, and the outer one situated almost on the median line of the tibia. Middle tibia slightly longer than the fore ones, the ventro-apical spurs subequal in length and the outer one not set in towards the median line; the dorsal surface armed with spines scarcely smaller than the ventral ones. Hind tibia similar to the intermediate ones but a little longer.

Tarsi differing conspicuously from those of the known material of the nearctic *campodeiformis* in which species the tarsal segments of all recorded specimens are simple, cylindrical and without pulvilli, while in the species now being characterized they are laterally expanded and the basal four are each furnished with a pair of partly membranous, laterally haired, lobe-like articulated ap-

pendages; the fifth segment bears a somewhat similar lobe, but apparently single and more membranous, which is situated about the middle of the ventral surface; the accompanying figures, pl. 3, figs. 2 and 3 of the right posterior tarsus of this insect, with a drawing of the corresponding tarsus of *campodeiformis*, pl. 3, figs. 4 and 5, for comparison, show the characters better than any description. The membranous portions of these pads shrivel to insignificance when dried, that of the fifth segment becoming practically invisible, but the chitinous parts, especially of those of the basal four segments, remain evident, though shrunken and more or less curled. The basal segment of the posterior tarsus is sub-cylindrical and broadening from the base outwardly, being about three times as long as the apical width, armed with three ventral spines on the inner side and four on the opposite side; on the inner side there is also an apico-lateral spine and the right tarsus has also an apico-lateral spine on the inner side but this is absent from the left tarsus, the absence of a socket indicating it was never present; second and third segments slightly more flattened and decidedly shorter, being less than twice as long as the apical width and basally narrowing into a cylindrical neck as shown in the figures; the second segment is armed with four apical spines, two ventral and two lateral, and the third with but two ventral spines; fourth segment similar to the preceding two but still shorter, being no longer than broad and without spines, only heavily haired as are all the segments; fifth segment much narrower than the others, much depressed and elongate, being about two and one-half times as long as broad. Intermediate and anterior tarsi similar to the posterior ones as described above except the segments are shorter, the basal segment of the middle foot being about twice as long as the apical width and that of the fore foot still shorter, and the basal segment of the anterior tarsus of both legs being without an apico-lateral spine on the outer side.

The claws are about three-fourths as long as the terminal tarsal segment, rather slender and with a microscopic triangular basal tooth.

This insect seems less campodeiform than shown by Walker's figures of the nearctic species, but in general appearance in life it is probably very similar. The general color is yellowish. The decidedly stouter spines of the entire insect, especially the legs, the structure of the antennae and of the last dorsal segment of the abdomen, and especially the tarsal formation should enable even the tyro to separate with assurance this Old World form from its New World relative.

Length, entire insect to tip of abdomen, about 21 mm.; pronotum, 4 mm.; fore femora, 3.9 mm.; fore tibia, 3 mm.; posterior tibia, 4 mm.; posterior femora, 4 mm.; cercus, 9 mm.; width, head, 4 mm.; pronotum, anteriorly, 3.5 mm.; mesonotum posteriorly, 3 mm.

One adult male, the holotype, taken at Chuzenji, Near Nikko, Japan, by J. L. King on September 15, 1922.

Type.—In collection, U. S. N. M., Catalogue no. 26848.

Nymph.—Besides the type there are two male nymphs evidently belonging here, taken by Mr. King and also deposited in the collection of the U. S. National Museum. These are more nearly like the described specimens of *campodeiformis*, the tarsal segments being cylindrical and without the remarkable ap-

pendages of the adult form of the present species, being similar to those of *campodeiformis* here figured; the eyes are black and more compact than in the adult; antenna about 7 mm. long and consisting of 40 segments, the third less elongate than in the adult, being less than twice as long as broad, and those immediately following are broadly transverse, those towards the apex becoming more elongate, those beyond about the middle of the antennae being subequal in length, each about three or four times as long as wide, the terminal one more narrowly rounded apically than the others. The basal two or three segments of the cerci are so closely united as to be distinguished with much difficulty, a rather careful examination failing to show with any clearness more than 8 segments, though there are really 9, the basal one being fused with the second and without spines, the rest armed as in the adult but the spines more slender. Coxities more nearly equal in size and more similar in shape than those of the adult and the terminal dorsal segment of the abdomen is apically rounded-triangular. The larger of these nymphs, marked paratype A, was taken at the same place and date as the type; the other, paratype B, was taken at the type locality on May 11, 1923.

REMARKS

Collecting dates.—Gallois' specimens were taken at Chuzenji, near Nikko, Japan. His collection dates are as follows: One adult male August 26, 1915, one adult female and a small nymph September 27, 1916. The Junior writer made two special trips to this same locality, one on Sept. 15, 1922, and secured one mature male and one nymph; the second trip occurred on May 11, 1923, which resulted in the capture of two additional nymphs.

Type locality and Habitat.—The type locality of this interesting insect is set in one of the most delightful mountain regions of Japan. The entire region is of volcanic origin and forms what is known as the Nikko Mountains. Chuzenji is a small settlement at the eastern end of the beautiful crater lake Chuzenji which has an elevation of some 4,460 feet. All specimens herein mentioned were taken on slope of Nantai San, a mountain which rises as a distinct peak from the eastern lake border, thus making the actual altitude where specimens were taken between 4,500 to 4,600 feet.

The forest in this particular region is old and little disturbed and at this altitude is quite similar to our northern American deciduous forests. The dominant species of trees occur in the following genera, *Fagus*, *Quercus*, *Acer*, *Cornus*, *Tillaea* and *Alnus* with a sprinkling of *Betula* and *Abies*. The lower vegetation, or ground covering plants consist largely of a dense growth of broad leafed bamboo about two feet in height, however such plants as *Aconitum impatiens* and several species allied to our *Cimicifuga* and *Podophyllum* manage to grow where conditions are unfavorable for the dominant bamboos.

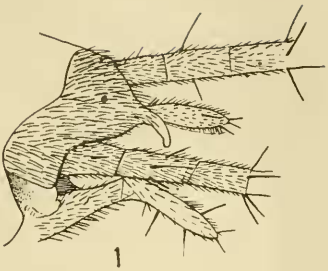
Habits.—The three immature specimens taken by King occurred under decaying logs in small natural cavities, no

distinct or special runways being observed. The only mature specimen taken was a male. This was found well within the heart of a great log which had been previously perforated by other insects.

Although at the time of collecting the weather was cold and the ground frosty, the insects were active. Their movements are rapid and may be compared to the cockroaches for agility. In captivity they are most active at night.

The two immature specimens collected May 11th, 1923, were kept alive for about one month in glass jars containing decaying wood and leaf mold. During this time they were taken from Japan to Korea with the hope that they could be reared to maturity. Attempts were made to feed them on numerous food stuffs such as fungi, tender plant tissues living and dead, starches, meats and small soft bodied insects both dead and alive; however, all seemed to fail and the specimens became less active and shrunken, finally one escaped and it was deemed wise to preserve the remaining one before it too was lost or injured.

Relationship.—The rather extraordinary tarsal structure of the adult of the above described species, considered in connection with the other less striking characters mentioned in the foregoing article, fully warrants the consideration of this genus as distinct from *Grylloblatta*. Indeed were it not for the fact that the value of a given character in the taxonomics of one group can not be taken as a criterion for judging the value of the same character in another group one might be justified in considering this tarsal formation as of even more importance than that herein assigned it. If this character existed in the nymphs as well as in the adult the present writers would consider it as of family or subfamily importance. Several detailed studies of the anatomy and phylogeny of *Grylloblatta campodeiformis* have been published by Drs. E. M. Walker and G. C. Crampton, neither of whom seem to have doubted the maturity of some of the material discussed. But studies made in writing the present paper has caused the senior author to rather seriously doubt if the real adult of the nearctic form is yet known, as in such case one would expect the tarsi to conform somewhat in structure to that of its palearctic relative. If it eventually results that the material of *campodeiformis* described as adult is actually fully matured and has tarsi similar to those of *Galloisia* as herein described and figured, this new genus will lose its most important diagnostic character. In such case, however, the other characters mentioned in the above description, together with additional ones which will very likely result from comparative studies of true adult material of both genera, will probably prove fully sufficient for the separation of this Old World genus from the New World *Grylloblatta*.



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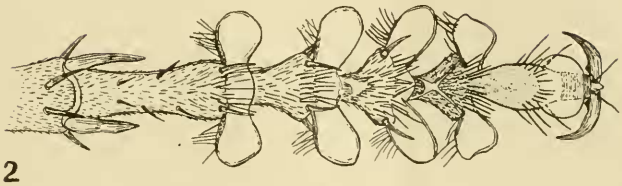

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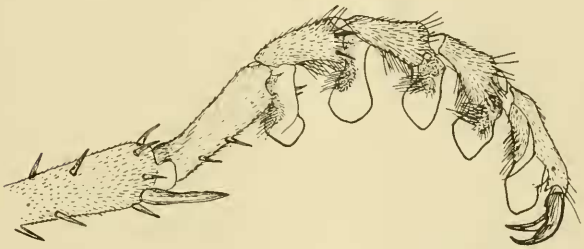
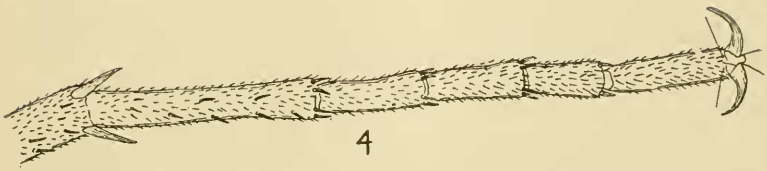


3 Galloisia nipponensis n. sp.



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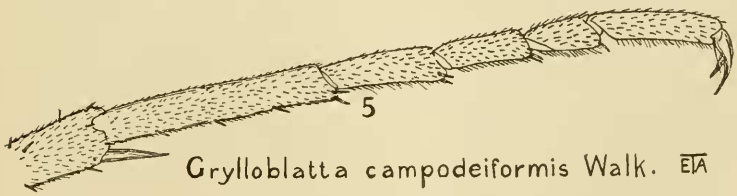

5

Grylloblatta campodeiformis Walk. ETA

Walker[1] erected the Family Grylloblattidae for his genus *Grylloblatta*, considering it as belonging to the Order Orthoptera. The following year Brues & Melander[2] raised this group to ordinal rank, calling it Grylloblattoidea. Later in the same year[3] Dr. Crampton arrived at the same conclusion, but erected for it the new name Notoptera. In papers of later date Walker and Tillyard have followed Brues and Melander in their use of the ordinal name Grylloblattoidea. A continuance of this usage is scarcely to be recommended as the termination "oidea" is, or at least should be, used for the ending of superfamily names. Notoptera is therefore decidedly preferable and should be used as priority in ordinal names is not obligatory under prevailing codes of nomenclature.

The wide distribution of the Notoptera as indicated by the above Japanese record strongly substantiates the idea of the antiquity of the order. This record adds to the group its second genus and the first record of its occurrence outside of the North American Continent.

Explanation of Plate 3.

Fig. 1. *Galloisia nipponensis* new species. Adult male. Dorso-lateral view of end of abdomen.

Fig. 2. *Galloisia nipponensis* new species. Adult male. Ventral view of right hind tarsus.

Fig. 3. *Galloisia nipponensis* new species. Adult male. Lateral view of right hind tarsus.

Fig. 4. *Grylloblatta campodeiformis* Walker. Male nymph. Ventral view of right hind tarsus.

Fig. 5. *Grylloblatta campodeiformis* Walker. Male nymph. Lateral view of right hind tarsus.

NEW SPECIES OF MYTHICOMYIA AND ITS RELATIONSHIP, WITH A NEW GENUS (DIPTERA).

By Charles T. Greene, *U. S. Bureau of Entomology*.

The new genus described below is so closely related to the genus Mythicomyia that I think it would be almost impossible to separate the two in the immature stages. Therefore I think the pupal characters below would hold just as well for the genus Mythicomyia. As this latter genus has always been in an unsettled state in regard to its location, I am giving my opinion on the location from the adult characters plus those of the pupa.

[1]1914, March. Can. Ent. vol. xlvi, pp. 93–99, pl. vi.

[2]1915, March. Keys to the families of North American Insects, pp. 1, 10, 13, pl. ii, fig. 19.

[3]1915, October. Ent. News, vol. xxvi, pp. 346, 347.